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| APPLICATION NO./ CONTROL NO. | FILING DATE | FIRST NAMED INVENTOR / PATENT IN REEXAMINATION | ATTORNEY DOCKET NO. |
|---------------------------------|-------------|---|---------------------|
|---------------------------------|-------------|---|---------------------|

09/646,680

24 Jan 00

Yamanaka

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SEN-1782/KOI

EXAMINER

Fuller, Eric

ART UNIT

PAPER

1762

16

DATE MAILED:

6/3/03

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner for Patents

AS16

Office Action Summary

Application No.

09/646,680

Applicant(s)

YAMANAKA ET AL.

Examiner

Eric B Fuller

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) 3-7, 10-13, 15, 18, 19 and 22-45 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 8, 9, 14, 16, 17, 20 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination

Due to arguments presented by the applicant, the finality of the previous Office Action has been withdrawn. A new Office Action is presented below.

Election/Restrictions

The lack of unity of the previous Office Action is maintained, as the following rejection in view of Desphandey et al. (US 4,961,958) shows the lack of a "special technical feature".

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 16, 17, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Desphandey et al. (US 4,961,958).

Desphandey teaches a process where resistance heats a tungsten filament in order to thermally decompose a reactant gas (column 5, lines 43-49). A dc voltage of 80 volts may be used to accelerate electrons towards an anode, which directs the reactive species towards the base (column 5, lines 49-54). Examiner interprets 80 volts

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to be below the glow discharge starting voltage, since the applicant has cited examples where a value of 500 volts is used and is below the starting voltage (page 44, line 8, of specification). Additionally, the reference teaches higher voltages may be used by using an RF plasma, indicating that the 80 volts is not of sufficient strength to be above the glow discharge starting voltage by comparison. As the electric field causes acceleration, this reads on providing kinetic energy. The filament may be heated to 1000 degrees Celsius (column 6, line 34). The substrate temperatures taught are within the applicant's claimed range (column 5, lines 5-15).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Desphandey et al. (US 4,961,958), as applied to claim 1 above, and further in view of Doi (US 5,900,161).

Desphandey teaches the limitations of claim 1, but fails to teach process of cleaning the deposition chamber after the coated substrate has been taken out. However, Doi teaches a plasma, self-cleaning technique where fluorine radicals are produced by an electric-discharge plasma (column 1, lines 45-51). It would have been

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obvious at the time the invention was made to a person having ordinary skill in the art to remove the substrate of Desphandey from the deposition chamber and then generate a plasma discharge from the electrodes with the proper feed gas being supplied. By doing so, the apparatus of Desphandey is self-cleaning.

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Desphandey et al. (US 4,961,958), as applied to claim 1 above, and further in view of Doi (US 5,900,161) and Moslehi et al. (US 5,464,499).

Desphandey teaches the limitations of claim 1, but fails to teach the gas distribution means as being an electrode. However, it has been shown above that it would have been obvious to use the plasma producing method of Doi in order to have the apparatus of Desphandey be self-cleaning. Additionally, Moslehi teaches a multi-electrode system that has the benefits of being able to selectively switch between processing a substrate and self-cleaning the chamber (column 3, lines 4-13). Other benefits include real-time control of the process (column 3, lines 14-20). Therefore, it would have been obvious to use such an electrode arrangement in the method of Desphandey. By doing so, the process is capable of being able to selectively switch between processing a substrate and self-cleaning the chamber, as suggested by Doi, and the user has real-time control of the process. By having the showerhead be an electrode, as taught in column 4, lines 33-62, the configuration of claims 8 and 9 are read upon.

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Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Desphandey et al. (US 4,961,958), as applied to claim 1 above, and further in view of Schrank (US 3,769,670).

Desphandey teaches the limitations of claim 1, but fails to teach that the tungsten is heated in a hydrogen-based atmosphere before supplying the material gas. However, Schrank teaches that because tungsten readily oxidizes when heated, it is necessary to use reducing atmospheres, such as hydrogen, when heating (column 1, lines 15-20). This reference further teaches that hydrogen bromide is preferred as the atmosphere gas when heating tungsten to temperatures of about 1500 degrees Celsius (column 1, lines 35-42). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to heat the tungsten in Desphandey in a hydrogen bromide atmosphere prior to introducing the material gases. By doing so, oxidation of the tungsten would be reduced or prevented. Examiner interprets hydrogen bromide gas to be a hydrogen-based gas.

Response to Arguments

The arguments presented by the attorney have overcome the rejections of the previous Office Action. The rejections of the previous Office Action have been withdrawn accordingly. The arguments are moot in view of the new grounds of rejection.

Conclusion

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The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gleason et al. (US 6,045,877) is cited for showing the electrode arrangement in a filament assisted chemical vapor deposition process.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric B Fuller whose telephone number is (703) 308-6544. The examiner can normally be reached on Mondays through Thursdays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck, can be reached at (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



EBF
June 2, 2003



TIMOTHY WEEKS
PRIMARY EXAMINER